Caltrans Strengthens Water Management During Drought

The direction from the governor's office in April was clear: For the first time in state history, the State Water Resources Control Board would implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent. Caltrans Director Malcolm Dougherty then challenged his department to cut water usage by 50 percent over 2013 totals.

Caltrans cut its use by more than half, and invested in technology, infrastructure and water management practices that will continue to reap savings well into the future, while protecting the health of roadside vegetation.

Through the first three quarters of this year – January through September – Caltrans consumed 62 percent less water than in the first three quarters of 2013. That's a savings of roughly three and one half-billion gallons, or enough water for 27,000 households for a year, based on the statewide average of 360 gallons per day or 131,000 gallons per year.

Caltrans has decades of experience in water conservation. In 1990, Caltrans used 13.4 billion gallons of water to irrigate 17,000 landscaped acres. In stark contrast, Caltrans in 2014 used less than 5 billion gallons of water to irrigate almost twice as much acreage. In 2015, Caltrans is on track to use 3 billion gallons of water, or 60 percent less than in 2013.

Year	Water Use (billion gallons)
2010	6.96
2011	6.40
2012	7.52
2013	7.41
2014	4.99
2015	2.87 (projected)

In the first three quarters of 2015, Caltrans reduced its water consumption by 61 percent compared to the same period in 2013. That represents a savings of $6.1 million.

Photo: Lake Mendocino

An Action Plan

In October, Caltrans issued its 2015 Drought Action Plan that mandates all project delivery activities must reflect the need to conserve water. This means that Caltrans "must evaluate all planting work that requires irrigation with potable water, in any phase of project delivery, regardless of funding source or purpose, to defer proposed planting work until both drought conditions improve and the use of potable water is not restricted for landscape purposes."

In addition, construction activities must also comply with local and state water reduction mandates and practices and all affected stakeholders must collaborate to resolve potential issues that could arise from delaying planting. At the same time, deferred commitments are to be tracked and monitored so they can be fulfilled once drought conditions are lifted.

And each of Caltrans' 12 districts have developed their own drought action plans, tailored to their region's water management needs.

Even if the El Niño weather phenomenon delivers significant rainfall this year, it is unlikely to end California's water woes. California's reservoirs will need three consecutive years with above-average rainfall just to bring them back to "normal."

As a result, Caltrans continues to invest in such things as "smart" irrigation controllers that automatically adjust watering to weather condition and soil moisture and will alert water managers if there is a break in the system. These sprinklers put water down just as the plants need it and reduce waste and inefficiencies. Staff is also being trained to use those controllers, which will someday assist in managing all Caltrans sprinklers. The department has allocated $62 million to modernize irrigation systems throughout the state, with another $152 million in the works. In addition, 544 staff in the Design, Maintenance and Construction divisions have been trained on irrigation management and water conservation.

Since Jan. 1, 2014, Caltrans has approved almost $214 million in spending to meet the director's orders in water reduction, with more than $130 million alone approved between June 1 and Oct. 2.

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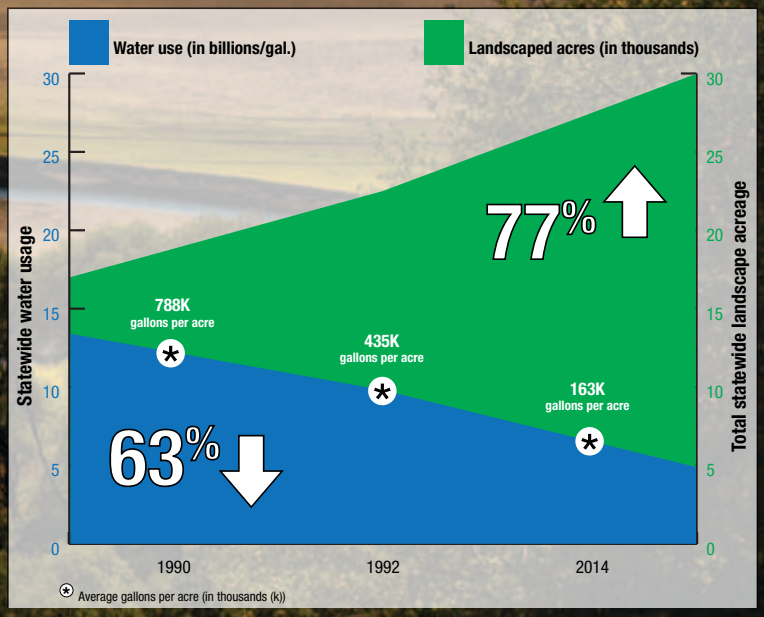

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A sizable portion of that money is being invested in the installation of pipelines to carry nonpotable or "recycled" water to Caltrans roadside planting sites. Every gallon of nonpotable water used is a gallon of drinking water saved, helping the department save not just in drought years, but far into the foreseeable future. Nonpotable usage is approaching 20 percent and Caltrans is working with regional water districts to get that number much higher.

The pipelines for the nonpotable water are seen as a necessary expenditure. Over the years, Caltrans has spent $1.4 billion in its landscaping and it would cost more than that to replace it all. This landscaping serves a purpose, keeping roadsides from eroding, helping to protect water quality, reducing the fire risk and keeping the roads free of dirt and debris.

Notably, Caltrans also improved its accounting systems to accurately track water consumption and reduce the potential for overcharges by water agencies. In addition, the department received more than $800,000 in rebates from water districts for achieving more efficient irrigation systems.

Unavoidable Losses

Despite these efforts, the drought still wreaked its damage, especially in the bone-dry forests, where dead or dying trees fueled a rash of wildfires throughout the state. In August, all 12 Caltrans districts identified the number of dead trees in the right-of-way. Of the half-million trees in Caltrans' right-of-way, an estimated 16,300 had died.

In October, Gov. Jerry Brown declared a state of emergency regarding the dead trees, not just in Caltrans' domain, but throughout the state. The U.S. Forest Service estimated that more than 22 million trees are dead in California and that "tens of millions more are likely to die by the end of this year," according to the proclamation.

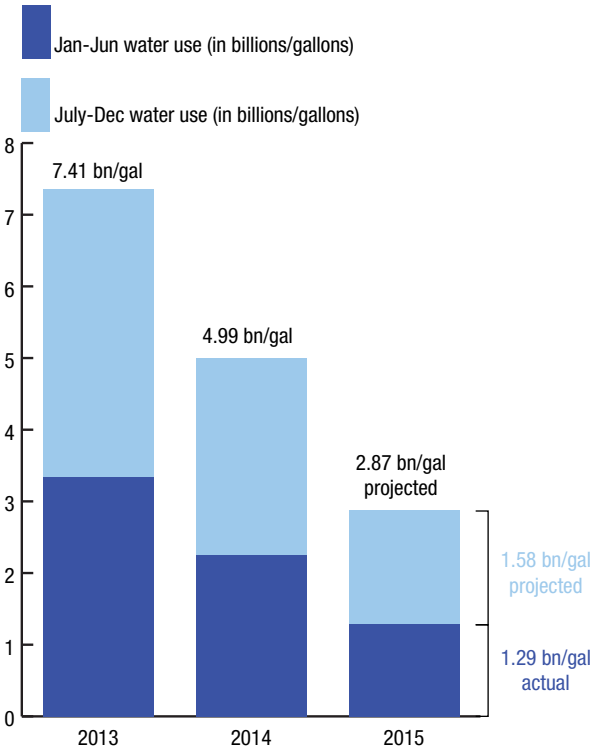
As a result, Caltrans was ordered to formally request immediate assistance through the Federal Highway Administration's Emergency Relief Program to obtain federal assistance for removal of dead and dying trees that are adjacent to the highways. Caltrans is also tasked with identifying road corridors where woodchips produced from dead trees can be used as mulch (due to the overabundance of woodchips, the emergency declaration supports directing woodchips to such sites as cogeneration plants, where the chips can be converted into energy).

Source: Division of Environmental
Contributor: Keith Robinson

Farmers uprooted trees near I-5 and Hwy 99 in Southern California

Caltrans Water Usage

(by half year increments)



Measurable Change

Through the Director's Orders, Caltrans has (or will soon accomplish):

- Put 25,196 of 26,425 acres of irrigated landscaping under Smart Controller management, almost doubling the acreage prior to the orders. The remaining 1,229 acres of landscaping were not appropriate for Smart controllers (due to solar powered controllers already in place, temporary irrigation systems, etc.)
- Converted irrigation systems to recycled or nonpotable water from potable water resulting in a reduction of 240 million gallons annually of potable water used to irrigate landscape.
- Installed 2,838 Smart controllers (78 percent) of all irrigation controllers.
- Created Water Manager positions in each district. Districts 4 (Bay Area) and 7 (Los Angeles) have two water managers each due to the high number of landscaped acres. Water managers will actively manage water application to ensure conservation practices continue.
- Replaced 39,000 sprinklers with more efficient sprinklers.
- Replaced 368,000 linear feet of damaged irrigation pipe.
- Replaced 1,361 building fixtures (faucets, toilets, etc.) with more efficient models
- Installed theft deterrence measures at 969 locations to reduce the possibility of vandalism which could damage irrigation systems and cause excessive water use.